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EXAMINER


LEUNG, JENNIFER A

ART UNIT	PAPER NUMBER
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1764

DATE MAILED: 06/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/623,018	Applicant(s) HILTUNEN ET AL. 	
	Examiner Jennifer A. Leung	Art Unit 1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 October 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>2,5</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION***Drawings***

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character “17” has been used to designate both “multiport cyclone” (page 9, line 22) and “nozzles” (page 10, line 10).
2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: “gas flow 11” (page 10, line 23); “bars 34” (page 11, line 20).
3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: “15” (FIG. 1).
4. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

5. The disclosure is objected to because of the following informalities:
 - In the Abstract, line 22, “prosesses” should be changed to -- processes --.
 - Consistency in claim terminology should be used for the following elements:

Element	Page	Lines	Terminology
3	9	17	cylindrical tubes
		27	the reactor outer shell
6	9	28	cylindrical tube
		30	the pressure shell
	10	4	steel tube
13	9	18	space
		21	axially annular riser space
	10	12	axially annular riser
		14	the riser

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Element	Page	Lines	Terminology
14	9	22	multiport cyclone 14, 17 having louvered vanes 14
	10	13, 15	the vanes
17	9	22	multiport cyclone 14 having louvered vanes 14
	10	10	nozzles
		16	inner reactor cyclone chamber
19	9	18	space
		23	transfer channel
	10	17	solids transfer channel
		19	internal recirculation channel
		20	channel
20	9	18	space
		23-24	transfer channel
	10	9	return channel
		17-18, 23	solids transfer channel
		19-20	channel
24	9	28-29	space
		33	axially annular space
	11	4, 7-8	annular riser channel
25	10	1	multiport cyclone 25, 26
	11	5	the vanes
26	10	1	multiport cyclone 25, 26
	11	9	the cyclone chamber
28	9	28-29	space
	10	3	transfer channel
	11	10, 13	channel
29	9	28	space
	10	3, 30	transfer channel
	11	2-3	solids transfer channel
		11, 17	return channel
		10-11	channel

6. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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7. Claims 1-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With respect to claim 1, it is unclear as to the relationship of “feedstock” (line 5) to the plural “feedstocks” set forth in the preamble. Furthermore, “the feed” (lines 3-4), “particulate matter” (lines 4-5) and “the converted hydrocarbon products” (line 9) lack proper positive antecedent basis. Furthermore, it is unclear as to the relationship between “a reactor (1-3)” (line 11) and “a fluidized-bed reactor (1-3; 41, 42, 52)” set forth in line 3. Likewise, “a regenerator (24, 28, 29, 43-45)” (line 14) and “a regenerator (24, 28, 29, 43-45)” set forth in line 6. Furthermore, it is unclear as to the relationship of “a riser (13; 41)” and “a fluidized-bed reactor (1-3; 41, 42, 52)” set forth in line 3. Likewise, the relationship of “a riser (24)” (line 14) and “a regenerator (24, 28, 29; 43-45)” set forth in lines 6-7 and 14.

With respect to claim 2, it is unclear as to the relationship between “an intershell riser space (13; 41)” and “a riser (13, 41)” and “a fluidized-bed reactor (1-3; 41, 42, 52)” set forth in claim 1, lines 3 and 11. Furthermore, it is unclear as to the structural relationship of the “two concentrically located cylindrical and/or conical envelope surfaces” to the other structural elements of the method.

With respect to claim 3, it is unclear as to the limitation applicants are attempting to recite by, “the vapour residence time of said process...” and whether applicants intended to recite, “the vapour residence time of said feedstock...”

With respect to claim 4, it is unclear as to the relationship between “a multiport cyclone (17)” and “a multi-inlet cyclone (14, 17; 50)” set forth in claim 1, line 12. Likewise, the

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relationship between “louvered vanes (14)” and “a multi-inlet cyclone (14, 17; 50)” set forth in claim 1, line 12.

With respect to claim 5, it is unclear as to the relationship between “the reactor (41, 42, 52)” and “a fluidized-bed reactor (1-3; 41, 42, 52)” and “a reactor (1-3)” set forth in claim 1, lines 3 and 11. Furthermore, it is unclear as to the structural limitation the applicants are attempting to recite by, “a circulating fluidized-bed reactor optionally having a channel”, since an optional limitation does not constitute a positive structural limitation.

With respect to claim 6, it is unclear as to the relationship between “the regenerator (43-45)” and “a regenerator (24, 28, 29; 43-45)” set forth in claim 1.

With respect to claim 7, it is unclear as to the relationship between “a dipleg (29; 45)” and a regenerator (24, 28, 29; 43-45)” set forth in claim 1. Furthermore, it is unclear as to which riser “the riser of the reactor” (line 2) is directed.

With respect to claim 8, it is unclear as to the relationship between “a drier (46-48)” and “a riser (46)”.

With respect to claim 9, it is unclear as to the relationship between “a dipleg (48)” and “a drier (46-48)” set forth in claim 8. Likewise, the relationship of “the riser (41) of the regenerator” (line 2) and “a fluidized-bed reactor (1-3; 41, 42, 52)” set forth in claim 1.

With respect to claim 10, it is unclear as to the relationship between “a channel (47)” and “the drier 46-48” set forth in line 1 and in claim 8.

With respect to claim 11, “the dipleg (45)” lacks proper positive antecedent basis.

With respect to claims 13-14, the recitation of “the feedstock is selected from...” (line 1) should be changed to -- the feedstock is selected from the group consisting of -- for the proper

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Markush format.

With respect to claim 15, “the first unit process” (line 7), “said riser (43)” (line 13), and “the risers (41, 46)” (line 15) lack proper positive antecedent basis. Furthermore, “hot” (line 4) is considered vague and indefinite, since “hot” is a relative term.

With respect to claims 16 and 17, “solid matter” (line 2) lacks proper positive antecedent basis, and it is unclear as to the relationship of the “solid matter” to the “particulate matter” set forth in claim 15, line 5. Also, in claim 17, “the reactor” lacks proper positive antecedent basis.

With respect to claim 18, it is unclear as to the relationship between “a riser (46)” (line 2) and “the risers (41, 46) of the reaction unit” set forth in claim 15, lines 15-16 and “the drying unit (46-48)” in line 1.

With respect to claim 19, it is unclear as to the relationship between “the riser (41) of the reaction unit” (lines 2-3) and “the risers (41, 46) of the reaction unit” in claim 15, lines 15-16.

With respect to claim 20, it is unclear as to the relationship between “the riser (46) of the drying unit” and “the risers (41, 46) of the reaction unit” set forth in claim 15, lines 15-16.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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8. Claims 1-7, 13 and 14 are rejected under 35 U.S.C. 102(e) as being anticipated by Ruottu et al. (U.S. 6,045,688).

With respect to claims 1 and 4, Ruottu et al. (FIG. 1; column 8, line 42 to column 10, line 9) discloses a process for thermal conversion of carbonaceous feedstocks such as biomass (column 11, lines 52-60), in which method

- The feedstock is fed into a fluidized bed reactor (tubes 1-3), wherein the feed is converted at an elevated temperature under the influence of particulate matter kept in a fluidized state by a fluidizing gas 8;
- The particulate matter is transferred from the reactor to a regenerator (inter-tube spaces 24, 28, 29) for regeneration and then recirculated to the reactor after the regeneration; and
- The converted hydrocarbon products are recovered from the reactor (i.e. exiting via center tube 21);

Characterized by using

- A reactor (tubes 1-3) which comprises a riser 13 having an axially annular cross section and being equipped with a multi-inlet cyclone (comprising louvered vanes 14, cyclone chamber 17) for the separation of particulate matter, and
- A regenerator (inter-tube spaces 24, 28, 29) which comprises a riser 24 having an axially annular cross section and being concentrically fitted in respect to the reactor 1-3, said regenerator being equipped with a multi-inlet cyclone (comprising louvered vanes 25, cyclone chamber 26) for separation of regenerated particulate matter.

With respect to claim 2, Ruottu et al. (FIG. 1; column 8, lines 47-60) disclose the reactor comprises an inter-shell riser space 13 formed between two concentrically located cylindrical

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and/or conical envelope surfaces.

With respect to claim 3, Ruottu et al. disclose the vapour residence time of said process is 0.1 to 5 seconds (i.e. a residence time of 0.05 - 10 s; reference claim 3).

With respect to claim 5, Ruottu et al. (FIG. 1; column 9, lines 23-32) disclose the reactor is a circulating fluidized-bed reactor optionally having a channel (i.e. solids transfer channel 19) for internal circulation.

With respect to claim 6, Ruottu et al. (FIG. 1; column 9, line 59 to column 10, line 9) disclose the regenerator is provided with a channel (i.e. return channel 29) for internal recirculation.

With respect to claim 7, Ruottu et al. (FIG. 1; column 9, line 59 to column 10, line 9) discloses the regenerator is provided with a dipleg (i.e. return channel 29) which communicates with riser 13 of the reactor.

With respect to claims 13 and 14, the Examiner takes Official Notice that it is well known in the art that "biomass" (column 11, lines 52-60) may comprise organic materials such as the recited forestry residues and thinnings, agricultural residues, energy crops, peat, refuse derived fuel, wastes from sawmills, plywood, furniture and other mechanical forestry wastes, plastic wastes and waste slurries, straw, olive thinnings, willow, energy hay and Miscanthous.

Instant claims 1-7, 13 and 14 read on the method of Ruottu et al.

9. Claims 1, 2, 7 and 13-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Squires (U.S. 4,032,305).

With respect to claim 1, Squires (FIG. 1, 5B, 5C, 5D; column 25, line 59 to column 28, line 8; column 47, line 32 to column 51, line 46) discloses a process for thermal conversion of

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carbonaceous feedstocks selected from biomass and organic wastes, in which method:

- The feedstock (introduced via lines **405**; FIG. 5B) is fed into a fluidized bed reactor (comprising zones **708**, **508**), wherein the feed is converted at an elevated temperature under the influence of particulate matter kept in a fluidized state by a fluidizing gas (introduced via multiplicity of pipes **14**);
- The particulate matter is transferred from the reactor **708**, **508** to a regenerator (comprising zones **8**, **9**) for regeneration (i.e. by contact with an oxygen containing gas, introduced via lines **202**) and then recirculated to the reactor **708**, **508** after the regeneration; and
- The converted hydrocarbon products are recovered from the reactor (via lines **18**, **118**).

Characterized by using

- A reactor **708**, **508** which comprises a riser having an axially annular cross section and being equipped with a multi-inlet cyclone (i.e. cyclone gas-solid separator **117**, having a multiplicity of outlet openings **416**) for the separation of particulate matter, and
- A regenerator **8**, **9** which comprises a riser having an axially annular cross section and being concentrically fitted in respect to the reactor **708**, **508** used, said regenerator **8**, **9** being equipped with a multi-inlet cyclone (i.e. cyclone gas-solid separator **17**, having a multiplicity of outlet openings **716**) for separation of regenerated particulate matter.

With respect to claim 2, Squires (FIG. 5B) discloses the reactor comprises an intershell riser space formed between two concentrically located cylindrical surfaces (i.e. the annular space defined by vessel wall **6** and partition wall **306**).

With respect to claim 7, Squires (FIG. 5B; column 50, line 60 to column 51, line 6)

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discloses the regenerator **8, 9** is provided with a dipleg (i.e. the U-tube **21**) which communicates with the riser of the reactor **708, 508**.

With respect to claims 13-14, Squires (FIG. 1; column 25, line 59 to column 26, line 43) further discloses the feedstock may be selected from a variety of carbonaceous materials, such as wood waste, agricultural wastes, municipal solid waste, sewage sludge, vegetable matter, and the like. Therefore, the recited feedstocks of forestry residues and thinnings, agricultural residues, energy crops, peat, refuse derived fuel, wastes from sawmills, plywood, furniture and other mechanical forestry wastes, plastic wastes, waste slurries, straw, olive thinnings, willow, energy hay and Miscanthous are within the scope of the method of Squires.

With respect to claim 15, Squires (FIG. 1, 5B, 5C, 5D; column 25, line 59 to column 28, line 8; column 47, line 32 to column 51, line 46) discloses an apparatus comprising:

- A drying unit **4** for drying the feedstock (column 42, lines 55-63);
- A reaction unit (comprising zones **708, 508**) in which the feedstock (introduced via lines **405**) is contacted with hot, fluidized-state particulate matter; and
- A regenerator unit (comprising zones **8, 9**) for regeneration of the particulate matter (i.e. via contact with oxygen containing gas introduced via lines **202**) contaminated in the first unit process;

Characterized in that

- The reaction unit **708, 508** comprises a riser with an axially annular cross section and having a multi-inlet cyclone (i.e. cyclone gas-solid separator **117**, having a multiplicity of outlet openings **416**) for separating solids from gas, and
- The regenerator unit **8, 9** comprises a circulating fluidized-bed reactor and a dipleg (i.e.

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U-tube 21), the regenerator unit 8, 9 being fitted about the reaction unit 708, 508 in a symmetrically concentric fashion, said riser of the regenerator unit 8, 9 having an axially annular cross section and being equipped with a multi-inlet cyclone (i.e. cyclone gas-solid separator 17, having a multiplicity of outlet openings 716) for separation of solids from gas, said dipleg 21 of the regenerator unit 8, 9 communicating with the riser of the reaction unit 708, 508 and with the drying unit 4 (see FIG. 5A, wherein line 5 exiting drying unit 4 is the equivalent of line 405).

Instant claims 1, 2, 7 and 13-15 read on the method and apparatus of Squires.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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10. Claims 3, 5, 6, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Squires (U.S. 4,032,305).

With respect to claim 3, Squires discloses the process is operated in a “fast fluidized condition”, wherein “the gas must be supplied at a rate to provide a velocity beyond a critical velocity characteristic of the solid... and the solid must be supplied at a rate beyond that at which the gas flowing at the given velocity is capable of conveying the solid upward in the dilute-phase condition,” (column 18, lines 26-33). However, Squires is silent as to whether the vapour residence time of the process may be 0.1 to 5 seconds. In any event, it would have been obvious for one of ordinary skill in the art at the time the invention was made to select an appropriate vapour residence time for the method of Squires, because the specific vapour residence time is not considered to confer patentability to the claim since the precise residence time would have been considered a result effective variable by one having ordinary skill in the art. Also, it is noted that the present specification sets forth on page 7, lines 19-23 and page 13, lines 10-13, that the claimed residence time, is at best, a preferred limitation. As such, without more, the claimed time cannot be considered “critical”. Accordingly, one having ordinary skill in the art would have routinely optimized the vapour residence time in the system to obtain the desired gas/solid velocity. *In re Boesch*, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980), and since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

With respect to claim 5, since the recitation of “a channel” is optional, the process of Squires meets the claim. In any event, Squires (FIG. 5B; column 51, lines 6-10) discloses reactor 708, 508 is a circulating fluidized-bed reactor having a channel (i.e. defined by a U-tube

721, for the circulation of material **722**). Although the channel is not internally located, it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to provide an internally located channel to enable “internal circulation” of the material, since such configuration is known in the art (FIG. 5H; internal channels **921**, **1021**).

With respect to claims 6 and 16, Squires (FIG. 5B; column 50, line 60 to column 51, line 6) discloses regenerator **8**, **9** comprises a channel (i.e. defined by the U-tube **21**) for recirculation of solid matter **22** to the regenerator. Although the channel is not internally located, it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to provide an internally located channel to enable “internal recirculation” of the material, since such configurations are known in the art (FIG. 5H; internal channels **921**, **1021**).

With respect to claim 17, Squires (FIG. 5B; column 51, lines 6-10) discloses the reaction unit **708**, **508** comprises a channel (i.e. defined by U-tube **721**) for recirculation of solid matter **722** within the reactor. Although the channel is not internally located, it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to provide an internally located channel to enable “internal recirculation” of the material in the method of Squires, since such configurations are known in the art (see FIG. 5H, wherein internal channels **921**, **1021** are provided).

11. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Squires (U.S. 4,032,305) in view of Munday (U.S. 2,515,155).

Although Squires is silent as to whether the multi-inlet cyclone may comprise louvered vanes, it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to provide louvered vanes to the cyclone in the method of Squires, on the

basis of suitability for the intended use and absent showing any unexpected results thereof, since the use of louvered vanes in the separation of solids from gases is conventionally known in the art, as evidenced by Munday. In particular, Munday teaches a cyclone separator comprising louvered vanes **14** (FIG. 2; column 2, lines 31-34).

12. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Squires (U.S. 4,032,305) in view of Ogorzaly et al. (U.S. 2,689,787).

Squires further discloses drying the feedstock in a drier **4** prior to introduction to the reactor (column 42, lines 55-63). However, Squires is silent as to the specific structure of the drier, such as whether the drier may comprise a riser having an axially annular cross section, being equipped with a multi-inlet cyclone. In any event, it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to select such a drier for drying the feedstock in the method of Squires, on the basis of suitability for the intended use and absent showing any unexpected results thereof, since such driers are known in the art, as evidenced by Ogorzaly et al. As illustrated in FIG. 1, Ogorzaly et al. teach a drier comprising a shaft **10** of annular cross-section and having a cyclone or separator **40** having multiple inlets **37**.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

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Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

13. Claims 1-7 and 13-14 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-12 of U.S. Patent No. 6,045,688.

Although the conflicting claims are not identical, they are not patentably distinct from each other. The reference patent substantially claims the instant process, namely a process for thermal conversion of a hydrocarbon-containing feed (reference claim 11; as defined in column 11, lines 52-60, a hydrocarbon-containing feed may comprise "biomass") wherein the feedstock is fed to a circulating fluidized bed reactor and converted at an elevated temperature under the influence of a particulate material kept in a fluidized state (reference claim 1); wherein the particulate matter is transferred from the reactor to a circulating fluidized bed regenerator for regeneration and then recirculated to the reactor (reference claims 6, 7); and wherein the converted products are recovered from the reactor (reference claim 1). The process is characterized by using a reactor comprising a riser having an axially annular cross section and being equipped with a multi-inlet cyclone having louvered vanes (reference claims 1, 4); and a regenerator comprising a riser having an axially annular cross section and being concentrically fitted with respect to the reactor (reference claims 6, 7). The reactor comprises an intershell riser space (reference claim 2), and the process comprises a vapour residence time of 0.1 to 5 seconds (reference claim 3).

Furthermore, it is well known in the art that "biomass" may comprise organic materials such as the recited forestry residues and thinnings, agricultural residues, energy crops, peat, refuse derived fuel, wastes from sawmills, plywood, furniture and other mechanical forestry wastes, plastic wastes and waste slurries, straw, olive thinnings, willow, energy hay and Miscanthus.

Allowable Subject Matter

14. Claims 9-12 and 18-20 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Ruottu '543 is presented to illustrate applicant's related invention.

* * *

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A. Leung whose telephone number is 703-305-4951. The examiner can normally be reached on 8:30 am - 5:30 pm M-F, every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola can be reached on 703-308-6824. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Jennifer A. Leung
May 28, 2003 *JAL*

Hien Tran
**HIEN TRAN
PRIMARY EXAMINER**